Spallation Neutron Source — Acceptance Strategy

Page 1 of ___ WBS Number _____ (__) *opt. AS # within WBS* QA Level __ (opt) Rev. ___

Title LANL D-plate

Description _____

Originator _____ Lab _____

(originator may list his/her part of the total strategy and request others to add to the list, but the final version must be approved)

#	Expectation	Location	Responsibility	Verified by	Date
0	**Background information** The Diagnostic Plate (D-plate) system consists of six major components: a) The D-plate vessel consisting of beam boxes and actively cooled beam dump. b) Diagnostics attached to the D-plate: *i) BPMs* *ii) BCM* *iii) Wire Scanners* *iv) Emittance scanner* *v) Faraday Cup* *vi) MPS pickups such as thermocouples* *vii) Phosphor screen* *viii) Segmented halo scraper* c) Cabling, cooling water connections d) Mechanical and vacuum components consisting of vacuum monitoring gages, *(what RGA?)* pumps, valves, beam dump cooling apparatus, pressure gauges and connections. e) Network attached devices (NAD) consisting of PCs/VME systems and associated mounting hardware, analog and digital boards, link interface, power connection via RABBITS, auxiliary electronics (i.e. RF reference chassis) and software (device drivers, LabVIEW VIs, dlls, channel access software, BIST software, gate array image, initialization file, etc). NAD has the following well-defined interfaces (as documented in the ICD): network, event link, RTDL, MPS, power, I/O. f) As-built documentation: schematics, block diagrams, PCB/BOM files, commented source code, gate array code, system configuration and initialization data, ICD, user manual, test procedures and software, troubleshooting guide, installation procedure, Test Reports/ QA records (Traveler), turn-on/set-up procedures, cable data, vendor-provided documentation. Notes on responsibility LANL has responsibility for the overall system design. Responsibility for the components is as follows: • D-Plate BPM electrodes: LANL • D-Plate Wire scanner: LANL				

	• D-plate Emittance scanner and collector (LANL), electronics (LBNL) • Faraday Cup: LANL • Cabling: LANL • Cable plant testing and verification: ORNL. • Electronics racks installation and preparation: ORNL. • RABBITS and network cabling: ORNL. • User interface software: ORNL. • MPS pickups such as thermocouples: LANL • Vacuum interface and pumps: LANL • NADs: LANL (includes content from LBNL) • Documentation: The partner lab responsible for each component provides as-built documentation for that component. System documentation (user manual, cabling data, etc) is provided by LANL as a first article and then maintained by ORNL on the project website and Oracle database. Cabling data including specification, length, termination, and routing. ORNL will provide barcode labels for major components.				
1	**Final design review(s) complete.** Final design documents are available on website along with Diagnostic Advisory Committee report/response. The following acceptance criteria are detailed in these documents: • Minimum and target performance requirements • Qualification test procedure: vertical integration tests that demonstrate potential to achieve target performance. • Component acceptance test procedures: tests of individual components that confirm minimum performance.	TBD	LANL	ORNL	
2	**Design Verification Tests** Mechanical components are assembled at LANL for rough integration. Vertical integration tests of each system listed in 0-b are performed at LANL and optionally, some tests are performed in parallel at ORNL. In addition, tests with beam are performed during MEBT commissioning at LBNL. These tests cover electronics for wire scanners, current monitors, BPM-phase, and emittance scanner. Testing of individual components is also performed at the responsible labs. These tests use pre-production components and must demonstrate that the system design is fundamentally capable of achieving the target performance requirements.	LANL/ ORNL/ LBNL	LANL/ORNL	ORNL	
3	**Acceptance and Final Production** Each component of 0-b will be first be received and tested at LANL to confirm as that they perform as designed. ORNL staff will participate in the tests at and in any vendor visits. All equipment will then be shipped to ORNL and accepted as follows:	LANL ORNL	LANL/ORNL	ORNL	

All production units are received and acceptance tested at RATS by ORNL personnel. All vendors' warranties are transferred to ORNL. Partner lab personnel will be available for consulting and will maintain test facilities at their site. If required, the responsible partner lab will repair units that fail acceptance tests. Test and repair can take place at RATS or at the partner lab. The handoff will be declared complete when the last article passes acceptance tests at ORNL and the required integrated tests are complete.

Systems listed in 0-b:
Acceptance of each system follows the individual "Acceptance Strategy" document; i.e. BPM follows the BPM strategy and WS follows its own.

Cable:
Cable assemblies will be tested with the electronics. Layout of the racks will be confirmed by ORNL.

Assemblies specific to the D-Plate:
Beamline assemblies and associated subsystems (cooling, vacuum, etc) will be tested at RATS. Some components will require further testing in the tunnel.

Integrated tests of systems:
NADs (including final software) will be tested in an integrated manner by ORNL. The test environment includes simulated beam signals, final cable types, event/RTDL inputs, and channel access client software. Testing will be performed under simulated SNS physical environmental conditions, network traffic, event rates, and client loads. Seamless integration with the EPICS control system will be demonstrated. System must run for more than 10 days without intervention. Tests of MPS integration are critical since the beam stop, wires, emittance device, and faraday cups cannot handle full beam power. The failure of water-cooled devices is particularly serious and MPS integration of these systems must be thoroughly tested.

Documentation:
Final, as built documentation will be released. Cabling data including specification, length, termination, and routing, will initially be provided by LANL. A database containing this information will be maintained by ORNL and verified by LANL. ORNL staff will revise documentation to match accepted components. Partner lab staff will consult in this process.

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Role	Name *(originator may suggest approvers)*	Plan Approval Signature	Date
SNS Division	Saeed Assadi		11-9-01
	Tom Shea		11-9-01
	Norbert Holtkamp		11-9-01
	Mike Plum, Diagnostics WPM		4/Nov/01
	Mark Gardner, QA Representative		6/Dec/01
	Will Fox, Project Office		11/06/01
	Don Rej, Division Director		11/6/01
Systems Integration			
SNS ES&H			
SNS QA			

Items/System Accepted at SNS
Installation Manager or designee — *Printed Name* — *Signature* — *Date:*